

# **Space Launch Systems**

October 19, 1988

**A. C. Morrissey**

**MARTIN MARIETTA**

# Operational Titan Launch Vehicles

Air Force launch vehicle for West Coast launches of small spacecraft.

Contract for refurbishment of fourteen Titan IIs through 1995.



**TITAN II**

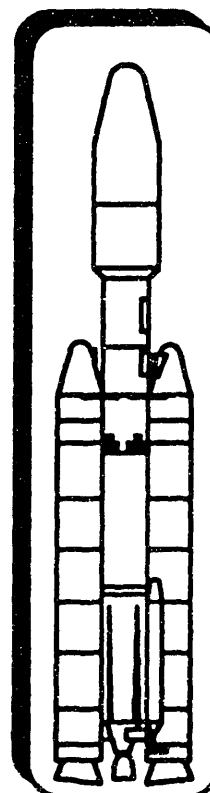
Low earth polar orbit  
(100 nm x 100 nm)  
performance capability  
4,200 lbs

Maximum payload  
envelope  
9.3 ft dia x 30 ft long

Martin Marietta launch vehicle for East Coast launches of commercial and government spacecraft.

Three DOD Titan 34Ds in inventory. Final launch in 1989.

First commercial launch in 1989.



**TITAN III**

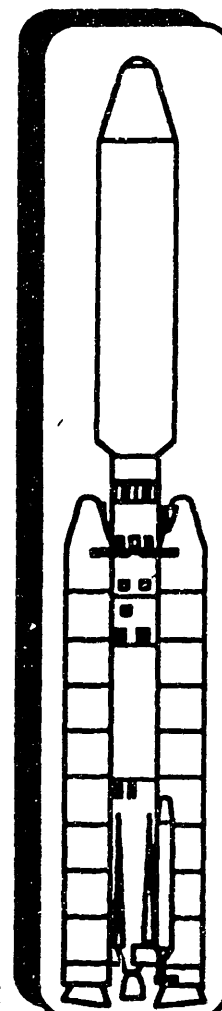
Geosynchronous transfer (Transtage, IUS, TOS) and low earth orbit missions (PAM-D, PAM-DII, SCOTS, integral)

Low earth orbit  
(80 nm x 140 nm)  
performance capability  
31,600 lbs

Maximum payload  
envelope  
12 ft dia x 47 ft long

Air Force launch vehicle for East and West Coast launches of large spacecraft.

Contract for 23 Titan IVs through 1993.



**TITAN IV**

Centaur, IUS, and No Upper Stage missions

East Coast  
Geosynchronous orbit  
performance capability  
10,000 lbs (with Centaur)  
12,700 lbs (SRMU)

Low earth orbit  
(80 nm x 95 nm)  
performance capability  
39,000 lbs  
48,000 lbs (SRMU)

West Coast  
Low earth polar orbit  
(100 nm x 100 nm)  
performance capability  
32,000 lbs  
40,000 lbs (SRMU)

Maximum 15 ft diameter  
payload envelope - 61.7 ft  
long

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# Titan IV

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# Titan IV Overview

**Customer :**

**Air Force Space Division**

**Program :**

**Build and launch twenty-three vehicles.**

**Initial Launch Capability:**

- Inertial Upper Stage - 4th quarter 1988
- No Upper Stage (CCAFS) - 1st quarter 1989
- No Upper Stage (Vandenberg) - 1st quarter 1990
- Centaur - 2nd quarter 1990

**Authority to Proceed :**

**February 28, 1985**

**Prime Contractor :**

**Martin Marietta**

- Airframe
- Vehicle Integration
- Payload Integration
- Launch Operations

**Principal Subcontractors :**

**General Dynamics**

**McDonnell Douglas**

**United Technologies**

**Hercules**

**Aerojet TechSystems**

**Delco Electronics**

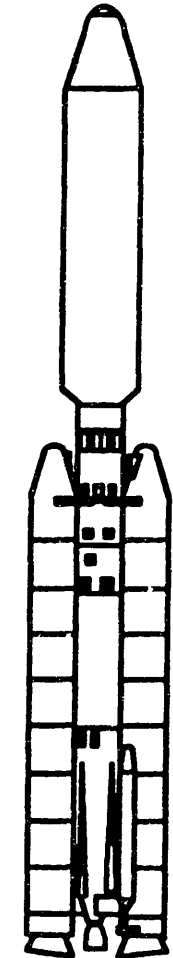
**SCI**

**Cincinnati Electronics**

**Analex**

**Boeing**

- Centaur Upper Stage
- Payload Fairings
- Solid Rocket Motors
- Solid Rocket Motor Upgrade
- Liquid Rocket Engines
- Guidance
- Instrumentation
- Command Receivers
- Centaur Consultant
- Inertial Upper Stage



**TITAN IV**

# Titan IV Program Summary

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## Program Status

- 23-vehicle program baseline; additional vehicle follow-on ATP early 1989
- Five configurations, two upper stages, and launch capability from both coasts

## Core Vehicle

- First flight vehicle on the launch pad
- Second flight vehicle delivered to Cape Canaveral

## Liquid Rocket Engines

- First five systems complete
- Two systems shipped to Cape Canaveral

## Solid Rocket Motors

- Reviews and testing complete
- First flight motors stacked and mated to core

## Solid Rocket Motor Upgrade

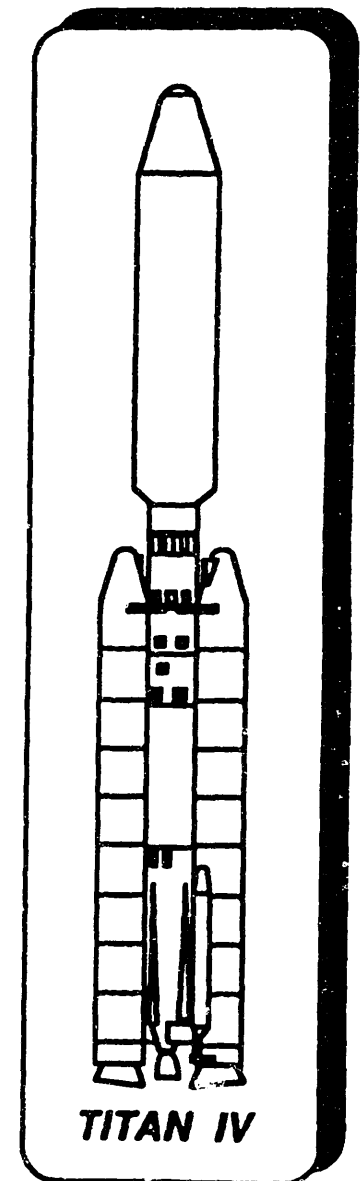
- First full-scale case winding complete
- Preliminary Design Review scheduled October 1988

## Payload Fairing

- Two units delivered to Cape Canaveral
- First flight unit in launch site processing

## Centaur

- Tank design complete, test tank in major weld
- Qualification/design evaluation tests in progress



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